

AMENDMENT TO THE CLAIMS

1. (Currently Amended) A control device for controlling at least one bottom dump air operated door for a railroad car movable between a closed position in which material within the railroad car is retained within the railroad car and an open position in 5 which the material within the railroad car is released therefrom comprising:

a housing supported by the railroad car;

a piston movable in said housing between a door closing position

and a door opening position in response to air pressure

10 acting in a first direction on said piston to cause movement of the door to its open position and to air pressure acting in a second direction on said piston to cause movement of the door to its closed position;

and a control element for preventing air pressure from acting in

15 the first direction on said piston until the air pressure exceeds a predetermined amount air pressure.

2. (Currently Amended) The control device according to claim 1

in which said control element comprises a pressure responsive

element between a source of air pressure and said piston to block

supply of air pressure in the first direction for preventing the

5 air pressure from acting in the first direction on said piston until the air pressure exceeds a predetermined amount air pressure.

3. (Currently Amended) The control device according to claim 2 comprising:

a first air passage in said housing communicating with a source of air pressure to cause air pressure to act on said piston in the first direction to move said piston to its door opening position when said piston is in its door closing position;

5 and said pressure responsive element comprising:

a first portion movably disposed in said first air passage; and a second portion holding said first portion in a passage blocking position until the air pressure exceeds a predetermined amount air pressure.

10 4. (Currently Amended) The control device according to claim 3 in which said second portion of said pressure responsive element is a resilient element disposed in said first air passage and continuously urging said first portion of said pressure responsive element into its passage blocking position when the air pressure does not exceed the predetermined amount air pressure.

5 5. (Original) The control device according to claim 4 in which:

said first air passage has a reduced area portion; and said first portion of said pressure responsive element is a ball urged into engagement with said reduced area portion of said first air passage by said resilient element to hold said ball in its passage blocking position.

6. (Original) The control device according to claim 5 comprising:

a second air passage in said housing communicating with the source of air pressure to cause the air pressure to act on said piston in the second direction to move said piston to its door closing position when said piston is in its door opening position;

a first activating element for allowing the air pressure to be applied to said piston to cause movement of the door to its open position when said ball is not in its passage blocking position and the railroad car is at a first predetermined position at which it is desired for the door to open to release the material in the railroad car;

and a second activating element for allowing the air pressure to be applied to said piston to cause movement of the door to its closed position when the railroad car is at a second predetermined position at which it is desired for the door to close, the second predetermined position being spaced a predetermined distance in the direction of movement of the railroad car from the first predetermined position.

7. (Original) The control device according to claim 6 in which:

said first activating element comprises a first solenoid activated in response to the railroad car being at the first predetermined position to cause the air pressure to be

applied to said piston in the first direction to cause movement of the door to its open position;

and said second activating element comprises a second solenoid activated in response to the railroad car being at the second predetermined position to cause the air pressure to be applied to said piston in the second direction to cause movement of the door to its closed position.

8. (Currently Amended) A control device for controlling at least one bottom dump air operated door for a railroad car movable between a closed position in which material within the railroad car is retained within the railroad car and an open position in which the material within the railroad car is released therefrom comprising:

a housing supported by the railroad car and having a sealed interior;

said housing having first and second chambers aligned with each other in its sealed interior and spaced longitudinally from each other;

a piston slidably disposed within the sealed interior of said housing;

said piston having:

15 one end disposed in said first chamber in sealing relation therewith;

and its other end disposed in said second chamber in sealing relation therewith;

a first end cap mounted at one end of said housing;

20        said first end cap having a first air passage communicating with  
              the sealed interior of said housing exterior of said first  
              and second chambers and a second air passage communicating  
              with said first chamber;

25        a first solenoid supported by said first end cap, said first  
              solenoid allowing air pressure to flow through said air  
              passage in said first end cap to said second air passage in  
              said first end cap when said first solenoid is activated;

30        a second end cap mounted at the other end of said housing;  
              said second end cap having a first air passage communicating with  
              the sealed interior of said housing exterior of said first  
              and second chambers and a second air passage communicating  
              with said second chamber;

35        a second solenoid supported by said second end cap, said second  
              solenoid allowing air pressure to flow through said first  
              air passage in said second end cap to said second air  
              passage in said second end cap when said second solenoid is  
              activated;

40        a sliding shoe valve disposed within the sealed interior of said  
              housing exterior of said first and second chambers and  
              connected to said piston for movement therewith;

45        said housing having a port communicating a source of air pressure  
              with the sealed interior of said housing exterior of said  
              first and second chambers;

              said housing having two ports communicating with a control member  
              for moving the door to its open or closed position depending

on the position of said sliding shoe valve relative to said two ports, one of said two ports supplying air pressure to the control member from the sealed interior of said housing exterior of said first and second chambers when the door in  
50 the railroad car is to be opened and the other of said two ports supplying air pressure from the sealed interior of said housing exterior of said first and second chambers to the control member when the door in the railroad car is to be closed;

55 said first air passage in said first end cap supplying air pressure from the sealed interior of said housing exterior of said first and second chambers through said second air passage in said first end cap to said first chamber to move said piston to its door opening position when said first solenoid is activated;

60 said first air passage in said second end cap supplying air pressure from the sealed interior of said housing exterior of said first and second chambers through said second air passage in said second end cap to said second chamber to move said piston to its door closing position when said second solenoid is activated;

65 and a control element disposed in said first air passage in said first end cap for preventing air pressure to pass therethrough until it exceeds a predetermined amount air pressure.

70

9. (Currently Amended) The control device according to claim 8 in which said control element comprises a pressure responsive element in said first air passage in said first end cap between the sealed interior of said housing exterior of said first and second chambers and said second air passage in said first end cap to block supply of air pressure through said second air passage to said first chamber for acting on said piston to move said piston to its door opening position when said piston is in its door closing position and said first solenoid is activated until 10 the air pressure exceeds a predetermined amount air pressure.

10. (Currently Amended) The control device according to claim 9 in which said pressure responsive element comprises: a first portion movably disposed in said first air passage in said first end cap; and a second portion holding said first portion in a passage blocking position until the air pressure exceeds a predetermined amount air pressure.

11. (Currently Amended) The control device according to claim 10 in which said second portion of said pressure responsive element is a resilient element disposed in said first air passage in said first end cap and continuously urging said first portion of said pressure responsive element into its passage blocking position when the air pressure does not exceed the predetermined amount air pressure.

12. (Original) The control device according to claim 11 in which:

    said first air passage in said first end cap has a reduced area portion;

5    and said first portion of said pressure responsive element is a ball urged into engagement with said reduced area portion of said first air passage in said first end cap by said resilient element to hold said ball in its passage blocking position.

13. (Currently Amended) A control device for controlling at least one bottom dump air operated door for a railroad car movable between a closed position in which material within the railroad car is retained within the railroad car and an open position in which the material within the railroad car is released therefrom comprising:

    a housing supported by the railroad car and having a sealed interior;

    said housing having first and second chambers aligned with each other in its sealed interior and spaced longitudinally from each other;

    a piston slidably disposed within the sealed interior of said housing;

    said piston having:

15    one end disposed in said first chamber in sealing relation ~~therewith~~ therewith;

and its other end disposed in said second chamber in sealing  
relation therewith;

a first end cap mounted at one end of said housing;

20 said first end cap having a first air passage communicating with  
the sealed interior of said housing exterior of said first  
and second chambers and a second air passage communicating  
with said first chamber;

a first activating element supported by said first end cap, said  
25 first activating element allowing air pressure to flow  
through said first air passage in said first end cap to said  
second air passage in said first end cap when said first  
activating element is activated;

a second end cap mounted at the other end of said housing;

30 said second end cap having a first air passage communicating with  
the sealed interior of said housing exterior of said first  
and second chambers and a second air passage communicating  
with said second chamber;

a second activating element supported by said second end cap,  
35 said second activating element allowing air pressure to flow  
through said first air passage in said second end cap to  
said second air passage in said second end cap when said  
second activating element is activated;

a sliding shoe valve disposed within the sealed interior of said  
40 housing exterior of said first and second chambers and  
connected to said piston for movement therewith;

45 said housing having a port communicating a source of air pressure with the sealed interior of said housing exterior of said first and second chambers;

50 said housing having two ports communicating with a control member for moving the door to its open or closed position depending on the position of said sliding shoe valve relative to said two ports, one of said two ports supplying air pressure to the control member from the sealed interior of said housing exterior of said first and second chambers when the door in the railroad car is to be opened and the other of said two ports supplying air pressure from the sealed interior of said housing exterior of said first and second chambers to the control member when the door in the railroad car is to 55 be closed;

60 said first air passage in said first end cap supplying air pressure from the sealed interior of said housing exterior of said first and second chambers through said second air passage in said first end cap to said first chamber to move said piston to its door opening position when said first activating element is activated;

65 said first air passage in said second end cap supplying air pressure from the sealed interior of said housing exterior of said first and second chambers through said second air passage in said second end cap to said second chamber to move said piston to its door closing position when said second activating element is activated;

and a control element disposed in said first air passage in said  
first end cap for preventing air pressure to pass  
therethrough until it exceeds a predetermined ~~amount~~ air  
pressure.

70

14. (Currently Amended) The control device according to claim  
13 in which said control element comprises a pressure responsive  
element in said first air passage in said first end cap between  
the sealed interior of said housing exterior of said first and  
second chambers and said second air passage in said first end cap  
5 to block supply of air pressure through said second air passage  
to said first chamber for acting on said piston to move said  
piston to its door opening position when said piston is in its  
door closing position and said first activating element is  
activated until the air pressure exceeds a predetermined ~~amount~~  
10 air pressure.

10

15. (Currently Amended) The control device according to claim  
14 in which said pressure responsive element comprises:  
a first portion movably disposed in said first air passage in  
said first end cap;  
5 and a second portion holding said first portion in a passage  
blocking position until the air pressure exceeds a  
predetermined ~~amount~~ air pressure.

16. (Currently Amended) The control device according to claim  
15 in which said second portion of said pressure responsive  
element is a resilient element disposed in said first air passage  
in said first end cap and continuously urging said first portion

5 of said pressure responsive element into its passage blocking position when the air pressure does not exceed the predetermined amount air pressure.

17. (Original) The control device according to claim 16 in which:

5 said first air passage in said first end cap has a reduced area portion;

and said first portion of said pressure responsive element is a ball urged into engagement with said reduced area portion of said first air passage in said first end cap by said resilient element to hold said ball in its passage blocking position.

18. (Currently Amended) A control device for controlling at least one bottom dump air operated door for a railroad car movable between a closed position in which material within the railroad car is retained within the railroad car and an open position in which the material within the railroad car is released therefrom comprising:

5 a housing supported by the railroad car;

10 a piston movable in said housing between a door closing position and a door opening position in response to air pressure acting in a first direction on said piston to cause movement of the door to its open position and to air pressure acting in a second direction on said piston to cause movement of the door to its closed position;

and a resiliently biased control element for preventing movement  
15 of said piston to its door opening position until the air  
pressure acting on said piston exceeds a predetermined  
amount air pressure.

19. (Currently Amended) The control device according to claim  
18 in which said resiliently biased control element comprises a  
pressure responsive element between a source of air pressure and  
said piston to block supply of air pressure in the first  
5 direction for preventing the air pressure from acting in the  
first direction on said piston until the air pressure exceeds a  
predetermined amount air pressure.

20. (Currently Amended) The control device according to claim  
19 comprising:

a first air passage in said housing communicating with a source  
of air pressure to cause air pressure to act on said piston  
5 in the first direction to move said piston to its door  
opening position when said piston is in its door closing  
position;

and said pressure responsive element comprising:

10 a first portion movably disposed in said first air passage;  
and a second portion holding said first portion in a passage  
blocking position until the air pressure exceeds a  
predetermined amount air pressure.

21. (Currently Amended) The control device according to claim  
20 in which said second portion of said pressure responsive  
element is a resilient element disposed in said first air passage  
and continuously urging said first portion of said pressure  
5 responsive element into its passage blocking position when the  
air pressure does not exceed the predetermined ~~amount~~ air  
pressure.

22. (Currently Amended) A control device for controlling at  
least one bottom dump air operated door for a railroad car  
movable between a closed position in which material within the  
railroad car is retained within the railroad car and an open  
5 position in which the material within the railroad car is  
released therefrom only when the railroad car is at a  
predetermined position along its predetermined travel path at  
which it is desired for the door to open comprising:  
a housing supported by the railroad car;  
10 a piston movable in said housing between a door closing position  
and a door opening position in response to air pressure  
acting in a first direction on said piston to cause movement  
of the door to its open position and to air pressure acting  
in a second direction on said piston to cause movement of  
15 the door to its closed position;  
and a control element for preventing the door from opening until  
the railroad car is at the predetermined position along its  
predetermined travel path and the air pressure in said  
housing exceeds a predetermined ~~amount~~ air pressure.

23. (Currently Amended) The control device according to claim  
22 in which said control element prevents the door from opening  
until the railroad car is at the predetermined position along its  
predetermined travel path by preventing air pressure from acting  
5 in the first direction on said piston until the air pressure in  
said housing exceeds a predetermined amount air pressure at the  
predetermined position of the railroad car along its  
predetermined travel path.

24. (Previously Presented) A method for controlling at least  
one bottom dump air operated door for a railroad car movable  
between a closed position in which material within the railroad  
car is retained within the railroad car and an open position in  
5 which the material within the railroad car is desired to be  
released therefrom only when the railroad car is at a  
predetermined position along its predetermined travel path  
comprising:

moving a piston in a housing between a door closing position and  
10 a door opening position in response to air pressure acting  
in a first direction on the housing piston to cause movement  
of the door to its open position and to air pressure acting  
in a second direction on the housing piston to cause  
movement of the door to its closed position;  
15 and preventing movement of the housing piston to its door opening  
position at the predetermined position of the railroad car  
along its predetermined travel path until a predetermined  
air pressure in the housing is exceeded.

25. (Currently Amended) The method according to claim 24 comprising preventing the air pressure in the housing from acting in the first direction on the housing piston to cause movement of the door to its open position unless the railroad car is at the predetermined position along its predetermined travel path and it is determined that the air pressure in the housing acting in the first direction on the housing piston exceeds a predetermined ~~amount~~ air pressure.

5 26. (Previously Presented) The method according to claim 25 comprising:

supplying the air pressure in the housing to act on a piston connected to the door and disposed in a cylinder supported by the railroad car to move the door connected piston to open the door when the housing piston is moved in the first direction;

10 and supplying the air pressure in the housing to act on the door connected piston and disposed in the cylinder supported by the railroad car to move the door connected piston to close the door when the housing piston is moved in the second direction.

27. (Previously Presented) The method according to claim 24 comprising:

supplying the air pressure in the housing to act on a piston connected to the door and disposed in a cylinder supported by the railroad car to move the door connected piston to

5

open the door when the housing piston is moved in the first direction;

and supplying the air pressure in the housing to act on the door connected piston and disposed in the cylinder supported by the railroad car to move the door connected piston to close the door when the housing piston is moved in the second direction.

28. (Currently Amended) A railroad car having at least one bottom dump air operated door movable between a closed position in which material within the railroad car is retained within the railroad car and an open position in which the material within the railroad car is released therefrom only when the railroad car is at a predetermined position along its predetermined travel path at which it is desired for said door to open; a cylinder supported by the railroad car; a piston disposed in said cylinder and connected to said door for moving said door between its closed and open positions; a control device for controlling supply of air pressure to said door connected piston to move said door between its closed and open positions; and said control device comprising:  
15 a housing supported by the railroad car; a piston movable in said housing between a door closing position and a door opening position in response to air pressure acting in a first direction on said housing piston to cause movement of the door to its open

20 position and to air pressure acting in a second direction on said housing piston to cause movement of the door to its closed position;

25 said housing piston allowing air pressure in said housing to act on one side of said door connected piston to open said door when the air pressure moves said housing piston to its door opening position to enable the air pressure in said housing to flow from said housing to said cylinder to act on the one side of said door connected piston;

30 said housing piston allowing air pressure in said housing to act on the other side of said door connected piston to close said door when the air pressure moves said housing piston to its door closing position to enable the air pressure in said housing to flow from said housing to said cylinder to act on the other side of said door connected piston;

35 and a control element for preventing movement of said housing piston to enable air pressure to flow from said housing to said cylinder to act on the one side of said door connected piston to open said door until the air pressure exceeds a predetermined amount air pressure at the predetermined position of the railroad car along its predetermined travel path.

29. (Currently Amended) The railroad car according to claim 28 in which said control element comprises a pressure responsive element between a source of air pressure and said housing piston to block supply of the air pressure in the first direction for preventing the air pressure from acting in the first direction on said housing piston until the air pressure exceeds a predetermined amount air pressure.

5 30. (Currently Amended) The railroad car according to claim 29 comprising:

a first air passage in said housing communicating with a source of air pressure to cause air pressure to act on said housing piston in the first direction to move said housing piston to its door opening position when said housing piston is in its door closing position;

10 and said pressure responsive element comprising:

a first portion movably disposed in said first air passage; and a second portion holding said first portion in a passage blocking position until the air pressure exceeds a predetermined amount air pressure.

31. (Currently Amended) The railroad car according to claim 30 in which said second portion of said pressure responsive element is a resilient element disposed in said first air passage and continuously urging said first portion of said pressure responsive element into its passage blocking position when the air pressure does not exceed the predetermined amount air pressure.

32. (Previously Presented) A control device for controlling at least one bottom dump air operated door for a railroad car movable between a closed position in which material within the railroad car is retained within the railroad car and an open position in which the material within the railroad car is released therefrom only when the railroad car is at a predetermined position along its predetermined travel path at which it is desired for the door to open comprising:  
5 a housing supported by the railroad car;  
a piston movable in said housing between a door closing position and a door opening position in response to air pressure acting in a first direction on said piston to cause movement of the door to its open position and to air pressure acting in a second direction on said piston to cause movement of the door to its closed position;  
10 and a control element for preventing movement of said piston to its door opening position at the predetermined position along its predetermined travel path until a predetermined air pressure in said housing is exceeded.  
15

33. (Currently Amended) The control device according to claim 32 in which said control element comprises a pressure responsive element between a source of air pressure and said piston to block supply of the air pressure in the first direction for preventing the air pressure from acting in the first direction on said piston until the air pressure exceeds a predetermined amount air pressure.

34. (Currently Amended) The control device according to claim  
33 comprising:

a first air passage in said housing communicating with a source  
of air pressure to cause air pressure to act on said piston  
5 in the first direction to move said piston to its door  
opening position when said piston is in its door closing  
position;

and said pressure responsive element comprising:

a first portion movably disposed in said first air passage;  
10 and a second portion holding said first portion in a passage  
blocking position until the air pressure exceeds a  
predetermined amount air pressure.

35. (Currently Amended) The control device according to claim  
34 in which said second portion of said pressure responsive  
element is a resilient element disposed in said first air passage  
and continuously urging said first portion of said pressure  
5 responsive element into its passage blocking position when the  
air pressure does not exceed the predetermined amount air  
pressure.